## Table of Contents

## Table of Contents
(Continued)

## Table of Contents
(Continued)

**Section** **Page**

## Table of Contents
(Continued)

## 48-1.03 New or Revised Access to the Interstate System

### 48-1.03(01) Applicability

Each entrance or exit point to an Interstate route is considered to be an access point. For example, a conventional diamond interchange has four access points, two on-ramps and two off-ramps. Locked-gate access is defined as an access point, and is described in Section 48-1.03(02) Item 9.

Revised access to an Interstate route is considered to be a change in the existing essential form, even though the sheer number of access points does not change. For example, adding a loop on-ramp in concert with a collector-distributor (C-D) roadway linked with a downstream diagonal on ramp to an otherwise conventional diamond interchange, or changing a cloverleaf interchange into a fully directional interchange is considered to be a revised access. Lengthening or adding auxiliary lanes at at-grade ramp terminals with crossroads or ramp-proper lanes is not, nor is converting a single-lane off- or on-ramp to dual-lanes. This is clarified in Sections 48-1.03(02) and 48-1.03(03).

The design of new or revised access must comply with AASHTO's *A Policy on Geometric Design of Highways and Streets*, AASHTO's *A Policy on Design Standards – Interstate System*, and this *Manual*.

Work determined to consist of new or revised access to the existing Interstate System will require development by INDOT to FHWA of a formal Request for New or Revised Access to the Interstate System, commonly referred to as an Interstate Justification (IJ) Study Report. The IJ is a stand-alone document which constitutes a request from INDOT for FHWA approval of new or revised access. The document will demonstrate that reasonable care has been taken in addressing eight criteria described in the *Federal Register* of February 11, 1998, and Section 48-1.03(03), confirming that future traffic operations along the affected Interstate corridor will not be adversely affected by the proposed action. The entire Interstate System in the State is under jurisdiction of INDOT. Only the Department, and not a local public agency or private concern, may develop an IJ and submit it to FHWA for approval.

The requirement for an IJ and such FHWA approval applies only for non-tolled Interstate routes and Interstate toll roads where federal-aid funds have been expended or where the tolled sections have been added to the Interstate System under the requirements of 23 USC 139(a). Access to non-Interstate freeways and to new Interstate highways do not require an IJ. The Department has the authority to approve new or revised access to all other types of routes where federal-aid funds

were used to acquire the access control. For this situation, the Department must obtain the value of the access from the appropriate property owner(s) and either credit the federal share under existing disposal requirements, or determine that the net proceeds can be handled in accordance with 23 USC 156. The Department may request FHWA advice or assistance on the acceptability of these types of new or revised access if desired.

### 48-1.03(02) Actions Requiring an IJ

The actions that require Department development and FHWA approval of an IJ are as follows:

1. establishing a new freeway-to-freeway (system) interchange;

2. major modification of a freeway-to-freeway interchange; e.g., adding new ramp(s), removing ramp(s) from service, significantly relocating tie-in points (terminals) on the freeway, or, where all movements are not currently accommodated, adding ramps to provide for all movements;

3. establishing a new or revised partial interchange of any form;

4. establishing a new freeway-to-non-freeway (service) interchange;

5. modification of an existing freeway-to-non-freeway (service) interchange, e.g., adding a new ramp, removing a ramp from service, significantly relocating tie-in points (terminals) on mainline freeway or crossroad, or adding or significantly altering collector-distributor (C-D) elements;

6. removal from service of select access points or ramps or an entire interchange;

7. changing the essential type of interchange, e.g., replace conventional diamond with partial cloverleaf;

8. changing the essential form of a ramp, e.g., directional, semi-directional, loop, or diagonal;

9. new or revised locked-gate access, or access via locked gates for privately or publicly employed personnel. Locked-gate access is limited to use by utility or Department personnel and not the general public; or

10. other forms of new or revised access not explicitly listed above, e.g., those rising to a level beyond incidental work.

### 48-1.03(03) Actions Not Requiring an IJ

The actions that do not require development of an IJ are as follows:

1. changing a single-lane freeway exit or entrance to a two-lane freeway exit or entrance;

2. widening a single-lane on- or off-ramp (ramp proper) to two or more lanes;

3. widening (adding auxiliary lanes to) an on- or off-ramp at its intersection with a crossroad (at-grade terminal) to provide two or more intersection approach lanes;

4. minor horizontal or vertical realignment of a ramp;

5. converting a taper-type on- or off-ramp to one of a parallel-type;

6. increasing the length of an on-ramp acceleration lane or an off-ramp deceleration lane;

7. addition of one or more continuous auxiliary lanes between two adjacent interchange ramps; or

8. other minor actions not explicitly listed above.

An analysis of traffic operation should typically be conducted. The Department should informally consult with the appropriate FHWA Transportation Engineer even if such project is not subject to FHWA oversight.

### 48-1.03(04) Coordination with National Environmental Policy Act (NEPA) Requirements

When a federal agency is required to make an approval action, regardless of the funding source, the NEPA process must be followed. Therefore, since FHWA approves from INDOT, a formal Request for New or Revised Access to the Interstate System (IJ analysis), the NEPA process must be followed when developing new or revised Interstate access. The NEPA process should proceed concurrently with development and analysis of (existing) Interstate access alternatives to

ensure that all decision-making regarding all viable alternatives that are expected to be acceptable by FHWA from a traffic-operations standpoint are analyzed and adequately considered. FHWA final IJ approval can only be obtained after completion of the NEPA process. The intention is to eliminate early alternatives that would not be acceptable from a transportation and safety operations standpoint. The final decision on a preferred and selected alternative is to be made as part of the NEPA process.

**48-1.03(05) General Steps in Revising or Adding Access to the Interstate System**

There are five major steps that normally should be followed for alternatives' development of IJ development for a more-complex proposed new or revised access to the Interstate System. These proposed actions usually require an Environmental Impact Statement (EIS) or an Environmental Assessment (EA) to complete the NEPA process. The first two steps effectively take place as a forerunner to the formal IJ process. Not all of these decision points are necessary for IJ development for a less-complex proposed new or revised access. In coordination with the appropriate FHWA Project Management Team Leader, some or all of the early decision points may be determined to be unnecessary and that only final approval should be requested. The basic steps, or decision points, are as follows:

1. Development of Alternatives. At the start of alternatives' development for actions that may ultimately require IJ preparation and approval, the Department will meet with FHWA to identify any special process and operational requirements. During the Engineering Assessment phase and early in the NEPA process, one or more alternative functional designs should be examined from primary aspects of traffic operation, safety, and cost-effectiveness in concert with overall social, economic, and environmental consequences. Alternatives that would not function adequately from a safety or traffic operations standpoint should be eliminated. During the NEPA alternatives'-screening process, appropriate intensity-of-alternatives' development should be carried out, along with analysis and coordination with other parties having a stake in the screening and ultimate access decision. The Production Management Division's Environmental Policy Team oversees development of IJ activities. The appropriate FHWA Project Management Team will serve as the Department's point of contact for this process of developing and screening alternatives. The Team's Transportation Engineer will represent FHWA in providing opinion and review of alternatives from a transportation-operations standpoint.

2. Concept Approval. A letter requesting concept approval of a new or revised access element will be submitted to FHWA once a single alternative has been identified as the conditionally recommended course of action emerging from the access concept's development phase and ongoing NEPA process. This may occur either before the Draft EIS is approved or before the final EIS, EA, or Categorical Exclusion (CE) is approved. If appropriate, the FHWA Project Management Team Leader will respond in writing within two weeks indicating the acceptability in concept of the recommended alternative and allow for the completion of the appropriate NEPA documentation and preparation of the formal IJ request. This will represent FHWA's Concept Approval, and is FHWA's opinion with respect to the engineering and operational acceptability of the recommended alternative based on the information available at that time. FHWA's Concept Approval is given with the understanding that the proposal will be that which is reflected in the final NEPA document, either CE, Finding of No Significant Impact (FONSI), or Record of Decision (ROD).

3. Draft IJ Report Development. The Department will initiate a meeting with FHWA to determine the scope of assessment unique to the particular new or revised access element. The Department will then prepare the draft document, focusing on the eight points of the *Federal Register* of February 11, 1998. The draft IJ will be submitted to the FHWA for comments.

4. Final IJ Submittal. Upon written reply/comments on the draft IJ from FHWA, the necessary revisions should be made. The Department may meet with FHWA to resolve significant issues, and/or upon request from FHWA. The final IJ should not be forwarded to FHWA until the preferred alternative within the context of the NEPA process is identified. By cover letter with the final IJ, the Department will request from FHWA a determination of engineering and operational acceptability of the new or revised access. The letter will also include the status of the NEPA evaluation.

5. Provisional and Final IJ Approval. FHWA will respond in writing within four weeks to INDOT's formal request for approval of new or revised access, effectively approving the final IJ. The letter from FHWA will indicate approval or denial of the request. It is understood that approval of the IJ proposal is provisional, if at that stage the NEPA process has not been fully executed. Upon approval of the final environmental document (CE, FONSI, or ROD), FHWA will issue the Department final IJ approval in writing.

**48-1.03(06) Content of the IJ**

The Request for New or Revised Access to the Interstate System, or IJ, must address the eight criteria outlined in the *Federal Register* of February 11, 1998, and described below. These criteria will be the focus of attention in the IJ. The IJ must directly respond to the eight criteria, in the order shown below. Other background information may be presented to supplement that core element. A clear description of the proposed new or revised access should be presented, generally in narrative form directing the reader to sketch-plan drawings. All relevant notes, summary printouts, and/or electronic input/output files of traffic operations analysis should be appended to the IJ document, be they from HCM / HCS, or other method of analysis.

Background information should be included that may help explain or support the proposal, including a description of the influence of the area's regional transportation network, and any known areas of concern, e.g., environmental, safety, related projects, and long-range transportation plans. A crash analysis summary must be included. The analysis must include a summary of crash data for the previous three-year period. There must be a discussion of the anticipated safety impact the access change will have on the Interstate-route mainline and interchange ramps. The analysis must demonstrate that the access change will not compromise safety. Any necessary design exceptions should desirably be identified. In addition, the total estimated cost of the project should be provided. A complex urban project may require a conceptual-stage signing plan if determined to be necessary by FHWA and the Department.

The following lists and clarifies the criteria shown in the *Federal Register* of February 11, 1998. For each of the eight criteria, the first paragraph restates the language in the *Federal Register*, unedited. The subsequent paragraphs serve to clarify the core statement.

1. *Existing Facilities. The existing interchanges and/or local roads and streets in the corridor can neither provide the necessary access nor be improved to satisfactorily accommodate the design year traffic demands while at the same time providing the access intended by the proposal.*

   The IJ should demonstrate that an access point is needed for regional traffic needs and not to solve local transportation needs. It is of utmost importance to maintain the integrity and primary function of the Interstate System. The Interstate facility should not be permitted to become part of the local circulation system but should be maintained as the main regional and inter-state highway it was intended to be. All reasonable measures should be made to provide local access and mobility by means of the non-Interstate network.

Existing or possible future roads or streets in the vicinity of the Interstate facility should be evaluated or considered for use as connections to existing adjacent interchange ramps, in lieu of adding a new interchange or ramp(s).

2. *Transportation System Management (TSM). All reasonable alternatives for design options, location, and transportation system management type improvements (such as ramp metering, mass transit, and HOV facilities) have been assessed and provided for if currently justified, or provisions are included for accommodating such facilities if a future need is identified.*

   All TSM strategies, including those that involve improvements to the existing non-Interstate roads and streets, should be fully explored in lieu of new or revised access to the Interstate system.

3. *Access Connections and Design. The proposed access connects to a public road only and will provide for all traffic movements, except in only the most extreme circumstances. Less than full interchanges for special purpose access for transit vehicles, for HOVs, or into park and ride lots may be considered on a case-by-case basis. The proposed access will be designed to meet or exceed current standards for federal-aid projects on the Interstate System.*

   Except in the most extreme circumstances, all interchanges should provide for all basic movements. Partial interchanges are generally unacceptable, in part because they have undesirable operational characteristics. Private-road access is not permitted on the Interstate System.

4. *Transportation Land Use Plans. The proposal considers and is consistent with local and regional land use and transportation plans. Prior to final approval, all requests for new or revised access must be consistent with the metropolitan and/or statewide transportation plan, as appropriate, the applicable provisions of 23 CFR 450 and transportation conformity requirements of 40 CFR 51 and 93.*

   Coordination with strategic, long-term transportation plans should be ensured, so as not to have fragmented consideration of revised or added access. The IJ should include a discussion as to how the proposal fits into the overall transportation plans for the area and, if it is an addition to the current plans for the area, how it affects the current plans. The IJ proposal does not have to be included in official transportation plans or approved by metropolitan planning organizations (MPOs) or similar organizations prior to

submittal to FHWA. However, if the project is within an MPO area, coordination with the MPO must occur. All such coordination must be completed before FHWA approval of the IJ. This should form part of the normal project development process. The expectation here is that any proposal is considered in view of currently known plans for transportation facilities or land use planning.

5. *Comprehensive Interstate Network Study. In areas where the potential exists for future multiple interchange additions, all requests for new or revised access are supported by a comprehensive Interstate network study with recommendations that address all proposed and desired access within the context of a long-term plan.*

   To the extent practicable, the Department will program, and thus allow coordinated analysis and project development, of logical Interstate segments which may include multiple access sites (interchanges).

6. *Coordination with Transportation System Improvements. The request for a new or revised access generated by new or expanded development demonstrates appropriate coordination between the development and related or otherwise required transportation system improvements.*

   It is incumbent upon the Department and FHWA to ensure that the Interstate System is preserved and improved in an orderly and coordinated manner to serve the public and maintain the essential function of this most important network of national highways. Therefore, if private development is the impetus behind the need for access, it is necessary to coordinate efforts with the private party in order to develop the access to achieve mutual benefits with no safety or operational adverse impacts on Interstate-route users.

7. *Status of Planning and NEPA. The request for new or revised access contains information relative to the planning requirements and the status of the environmental processing of the proposal.*

   Information should be confirmed and reported relative to the status of the planning and NEPA processes with regard to the access request.

8. *Operational Analysis. The proposed access point does not have a significant adverse impact on the safety and operation of the Interstate facility based on an analysis of current and future traffic. The operational analysis for existing conditions shall, particularly in urbanized areas, include an analysis of sections of Interstate to and including at least the first adjacent existing or proposed interchange on each side. Crossroads and other roads and streets shall be included in the analysis to the extent necessary to assure their ability to collect and distribute traffic to and from the interchange with the new or revised access points.*

Sufficient operational analyses should be made to determine the impact of the revised or new access on the Interstate-route operation. The Transportation Research Board's *Highway Capacity Manual (HCM)* analysis procedures should be used. Analysis based on other methodologies is not acceptable. The *HCM*'s companion software, HCS, may be used. Other software tools that precisely replicate *HCM* methodologies may be used. Analysis by means of other (software) models that do not precisely employ *HCM* equations and logic may be presented but only as supplementary information.

The operational analysis of the proposed change should be carried out for multiple years, typically to a base year or anticipated open-to-traffic year, and to a design year which is approximately 20 years after the anticipated open-to-traffic year.

The operational analysis should be extended as far along the mainline and should include adjacent downstream interchanges as necessary to establish the extent and scope of the impacts. This could be critical in an urban area with many interchanges spaced at less than 1.6 km apart. As a minimum, the operational impact on the mainline Interstate route between the proposed new or revised access and immediately adjacent existing downstream interchanges on either side must be analyzed. The exact adjacent interchanges to be analyzed will be determined jointly by FHWA and the Department. Crossroad analysis is always required at the subject (core) interchange, between, through, and outside of ramp terminals on the crossroad. Analysis of the crossroads of the adjacent downstream interchanges is normally not required in an IJ, unless circumstances dictate otherwise.

Appropriate, sanctioned traffic data provided by the Planning Division's Traffic Monitoring Team should be used as the basis for operational analysis for the IJ process. The traffic counts and projections should be approved by the Department, developed using acceptable industry and agency standards.

a. Drawings. A dimensioned drawing(s) of preferred scale 1:2000 to 1:4000 should be provided as an attachment to the IJ document. The drawing(s) should show the functional elements of the existing and proposed conditions, including, as applicable, project limits, adjacent interchange(s) along the freeway, adjacent intersections along the crossroad, ramps to be added, ramps to be removed, relocation of ramp gores, configuration, travel lanes, auxiliary lanes, ramp radii, acceleration and deceleration lanes, taper lengths, freeway ramp terminals, and C-D roadways.

A drawing or series of drawings should be provided showing the traffic volumes for all through and turning movements, as well as data on C-D roadways, local service roads, and origin-destination (O-D) travel particularly for weaving movements. The base-year or open-to-traffic-year AADTs should be identified for the mainline, crossroads, ramps, and intersections. The design-year AADTs, morning and evening DHVs, and trucks percentages for each movement should be included.

b. Highway Capacity Analysis. A narrative of the assumptions used and reasons for any changes in the software default values should be included. Results of operational analysis, in the form of service levels for each element of the Interstate-route access facility, and for multiple years and periods of the day, should be clearly presented on a drawing at a scale of 1:2000 to 1:4000.

The summary results, typically in levels-of-service (LOS), should be provided for each element, e.g., weaving, basic freeway ramp merge and diverge, ramp proper, at-grade signalized and unsignalized ramp terminals (intersections), crossroad arterial and its intersections in the access influence area for existing (no-build) and proposed (build) conditions in the base year or open-to-traffic year, and in the design year for morning and evening peak periods.

Queue analysis should be provided as part of the traffic operational analysis for those points where significant queuing might be expected, such as at ramp junctions with the crossroad and at major intersections on the crossroad adjacent to at-grade ramp terminals.

All highway capacity and operations calculations must be included in an Appendix to the IJ. If the nature of the project entails a level of traffic operations analysis generating inordinately large volumes of output, the bulk of the hand calculations and printout of the HCS or other software tools may be provided in electronic format (on a compact disc) if desired, rather than on a hardcopy. However, at least 10% of the points checked for LOS must be in hardcopy format. In this case, a variety of points should be selected for the sample to be printed in paper format, especially critical locations. In addition, a hardcopy of all analyzed weaving areas must be included in the Appendix.

Any adjacent interchange, or intersection adjacent to the core access point/interchange, which is found to have a LOS below D for any of its elements, must be clearly identified. The IJ must contain a discussion of the impact this will have, if any, on the new or revised interchange(s) and Interstate-route mainline. Potential mitigation measures to alleviate any adverse impacts to the core access point/interchange must be described to at least a concept level. An alternative would be to describe the mitigation measures in the IJ transmittal letter to FHWA or in a separate correspondence with FHWA.

c. Crossroad Highway Capacity Analysis. Intersections at ramp terminals and along crossroads must be analyzed to determine if they could have a negative impact on Interstate-route operations. Basically, the crossroads must be capable of collecting and distributing traffic to and from the Interstate route.

All stop-controlled and signalized intersections within 400 m of the ramp terminal must be analyzed for traffic operation. It may be necessary to analyze intersections on the crossroad beyond 400 m. In some circumstances it may be beneficial to assess traffic operational conditions 600 m or 800 m beyond the ramp limits. The exact intersections to be analyzed along the crossroad will be determined jointly by FHWA and the Department.

If the analysis shows that any adjacent intersection will operate at LOS of E or F in the design year, a LOS analysis must be done to determine when the adjacent intersection becomes unacceptable, i.e., below LOS of D.

Any intersection that is shown to have a LOS of E or F in the open-to-traffic year or 7 years beyond must be investigated to at least a concept level to determined what needs to be done to make it operate at LOS of D or better in the design year, e.g., add lanes. In addition, it will be necessary to determine whether the failure is the result of normal traffic growth or the result of the interchange access change. The Department and the responsible local public agency will determine who will be responsible for any necessary intersection improvements outside of the interchange area (to adjacent intersections) and when they will be accomplished. The Department will notify FHWA of the action to be taken either in the IJ, the IJ transmittal letter, or by separate correspondence.

Those intersections which are shown to have a LOS of E or F between years 7 and 20 will be monitored for needed improvements. The IJ, the IJ transmittal letter, or separate correspondence must identify who will be responsible for this activity.

## 48-1.03(07) FHWA Approval

Approval is required from the FHWA Washington, D.C., Headquarters office (HQ) for the major types of new or revised access requests listed below. Two copies of the Final IJ must be sent to the FHWA Indiana Division Office for those actions of a significant nature requiring coordination with HQ. Advance coordination with HQ may be necessary for certain complex or controversial projects. For these situations, the Department should coordinate directly with the Division Office, specifically, the appropriate Transportation Engineer.

1. FHWA Approval by HQ. HQ approval is required for the types of Interstate System new or revised access as follows:

   a. establishing a new freeway-to-freeway (system) interchange;

   b. major modification of a freeway-to-freeway interchange;

   c. establishing a new partial interchange of any form; or

d. establishing a new freeway-to-non-freeway (service) interchange in a Transportation Management Area (TMA). A TMA is defined as an urbanized area with a current population of more that 200,000 as determined by the most recent decennial census, or as an area for which the TMA designation is requested by the governor and the MPO or affected local officials, and officially designated by the Administrators of the FHWA and the Federal Trade Administration.

2. FHWA Approval by Division Office. One copy of the Final IJ must be sent to the Division Office for approval for the types of Interstate system new or revised access as follows:

a. establishing a new freeway-to-non-freeway interchange not located in a TMA;

b. modification of an existing freeway-to-non-freeway interchange configuration;

c. establishing locked-gate access; or

d. removal from service of ramps or interchanges.

FHWA approval of an IJ is valid for 10 years from the date of the letter granting its final approval. If 10 years have expired before proceeding with construction of the new or revised access, it will be necessary to re-evaluate the IJ. This involves obtaining current traffic data for that time, projecting such data out to 20 years and determining if the originally approved IJ will still provide acceptable levels of service for the new design year. Basically, it will be necessary to repeat the procedures outlined herein and produce a revised IJ for FHWA approval.

### 48-1.04 Grade Separation Versus Interchange

Once it has been determined to provide a grade-separated crossing, the need for access between the two roadways with an interchange must be determined. The following lists several guidelines to consider when determining the need for an interchange:

1. Functional Classification. Interchanges should be provided at all freeway-to-freeway crossings. On fully access-controlled facilities, interchanges should be provided with all major highways, unless this is determined inappropriate for other reasons. Interchanges to other highways should be provided if practical.

2. Site Conditions. Site conditions which may be adaptable to a grade separation may not always be conducive to an interchange. Restricted right-of-way, environmental concerns, rugged topography, etc., may restrict the practical use of an interchange.

3. Interchange Spacing. When interchanges are spaced farther apart, freeway operations are improved. Spacing of urban interchanges between interchange crossroads should not be less than 1.5 km. This should allow for adequate distance for an entering driver to adjust to the freeway environment, to allow for proper weaving maneuvers between entrance and exit ramps, and to allow for adequate advance and turnoff signing. In urban areas, a spacing of less than 1.5 km may be developed by grade-separated ramps or by collector-distributor roads. In rural areas, interchanges should not be spaced less than 5 km apart on the Interstate system or 3 km on other systems.

4. Access. Interchanges may be required in areas where access availability from other sources is limited, and the freeway is the only facility that can practically serve the area.

5. Operations. Grade separated facilities without ramps will require all drivers desiring to turn onto the cross road to use other locations to make their desired moves. This will often improve the operations of the major facility by concentrating the turning movements at a few strategically placed locations. However, undue concentration of the turning movements at one location may overload the capacity of the exit or entrance facility.

6. Overpass Versus Underpass Roadways. A detailed study should be made at each proposed highway grade separation to determine whether the main road should be carried over or under the crossroad. Often the decision is based on features such as topography or functional classification.